IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Geoff W. Taylor

SERIAL NO.: 10/689,019 GROUP ART UNIT:

FILED: October 20,2003 EXAMINER:

FOR: Imaging Array Utilizing Thyristor-Based Pixel Elements ATT'Y DOCKET: OPE-007

Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

I hereby certify that this correspondence is being deposited on this day with the United States Postal Service as first class mail in an envelope addressed to : Commissioner of Patents and Trademarks, Washington, D.C. 20231.

David S. Jacobson 4/13/04
Date
Reg. No. 39,235

Sir:

SUBMITTAL OF
DOCUMENTS PURSUANT TO DUTY OF DISCLOSURE

Pursuant to applicant's duty of disclosure 37 CFR Section 1.56, enclosed is a completed form PTOL-1449 as well as copies of the cited documents which relate to the above-referenced patent application.Since this document submittal is being presented prior to the first examination on the merits, no fee is due herewith.

The two relevant PCT applications are PCT/US02/06802 and PCT/US03/13183, both by Taylor.

The enclosed articles are as follows:

"A Resistive-Gate Al0.3Ga0.7As/GaAs 2DEG CCD With High Charge-Transfer Efficiency at 1 Ghz" describes their high speed analog signal processing capability and intrinsic radiation hardness.

"Simluation, Design, and Fabrication of Thin-Film Resistive-Gate GaAs Charge Coupled Devices", Describes the development of high speed GaAs CCD's for the capture of single-event electro/photo-transients in scientific experiments.

"The Tacking CCD: A New CCD Concept" This is a new type of charge transport mechanism that is suitable for junction as well as MOS-type CCD's.

"GaAs Charge-Coupled Devices". This reports on the first Canadian involvement in the design, process development, fabrication, and evaluation of a gallium arsenide (GaAs) charge-coupled device (CCD). The project is application driven.

"Characterization of Evaporated Cr-SiO Crmet Filmns for Resistive-Gate CCD Applications". This describes the characterization of electron-beam evaporated Cr-SiO films (cermet) used for resistive-gate charge-coupled devices (CCD's).

"A Two-Phase GaAs Cermet Gate Charge-Coupled Device" describing the design, fabrication, and operation of a 64-pixel, 2-phase GaAs cermet gate charge-coupled device.

"Optical Charge Injection Into a Gallium Arsenide Acoustic Charge Transport Device". This article descibes the transport of photoelectrons by the (110) propagating surface acoustic wave (SAW) on (100)-cut gallium arsenide.

"Three-Phase GaAs Schottky-Barrier CCD Operated up to 100-MHz Clock Frequency" This article describes the fabrication of GaAs CCD's with 5-pm electrodes using a process fully compatible to MESFET integarted circuits.

"Uniphase Operation of a GaAs Resistive Gate Charge-Coupled Device" describes the operation and device fabrication of the GaAs resistive gate charge coupled device.

"Two-phase GaAs Cermet-Gate Charge-Coupled Devices" describes the operation and fabrication of the devices.

"Optimization of Thin-Film Resistive-Gate and Capacitive-Gate GaAs Charge-Coupled Devices". This article describes the computer simulation of high-speed gallium arsenide charge coupled devices performed by using a two-dimensional semiconductor device, simulation program.

"The Surface Potential Variation in the Interelectrode Gaps of GaAs Cermet-Gate Charge-Coupled Devices". This is a transmission line model for the cermet, GaAs junction which is proposed and used to investigate the variation of the surface potential along the interelectrode gaps of a GaAs cermet gate charge-coupled device (CMCCD).

"KODAK CCD Primer" This primer is intended for those involved with CCD image sensing applications who wish to obtain additional insight into the mechanisms of CCD sensor principles and operations.

"Quantum Well Infrared Photodetector (QWIP) Focal Plane Arrays" This article describes the various types of QWIPs, Figures of Merit, Light Coupling, imaging focal plane arrays and applications.

"Solid-State Imaging with Charge-Coupled Devices" describes the timing diagram of the four-phase clock-pulse generator.

"Submicrometre Gate Length Scaling of Inversion Channel Heterojunction Field Effect Transistor". This article reports the scaling of the inversion channel HFET to 0.5pm and discusses the scaling implications on the device performance and characteristics.

"Theoretical and Experimental Results for the Inversion Channel Heterostructure Field Effect Transistor". This article describes the device structure,charge and voltage relations, threshold voltage, short channel effects, experimental results, dependence of the threshold voltage on collector bias, conduction characteristics, and conclusion.

"Broad-Band GaAs/AlxGa1-xAs QWIPS" is a technical support package which describes the development of the broad-band responses which are obtained by varying depths and widths of the wells and the thicknesses of the barriers between the wells.

"High Temperature Annealing of Modulation Doped GaAs/A1GaAs Heterostructures for FED Applications" describes the experiments of different techniques of the applications.

"Heterojunction Field-Effect Transistor (HFET)" A new form of FET is proposed for implementation in a heterojunction material system sucha AlGaAs/GaAs.

"Detection of Terahertz Light With Intersubband Transitions in Semiconductor Quantum Wells" This article discusses the results from devices that have been designed to let us directly study several detection methods and general intersubband dynamics.

"10-Gb/s High-Speed Monolithically Integrated Photoreceiver Using InGaAs p-i-n PD and Planar Doped InA1As/InGaAs HEMT's" describes an extremely high-speed monolithically integrated receiver whose 3 dB down frequency is 8 Ghz.

"10-Gbit/s InP-Based High-Performance Monolithic Photoreceivers Consisting of p-i-n Photodiodes and HEMT's". This article describes the Circuit Design, Structure and Fabrication, and Device and OEIC Array Characteristics.

"10 Ghz Bandwidth Monolithic p-i-n Modulation-Doped Field Effect Transistor Photoreceiver". This article describes the fabrication of the photoreceiver circuit.

"20 Gbit/s Long Wavelength Monolithic Integrated Photoreceiver Grown on GaAs" describes the first 20Gbit/s long wavelength monolithic integrated photoreceiver grown on GaAs.

"Monolithic Integrated Optoelectronic Circuits". This article reviews the activities of the Fraunhofer IAF on optoelectronic integrated circuits (OEIC's) for serial and parallel optical links.

The listed documents are brought to the Examiner's attention because they are known to the applicant and/or the applicant's attorney and may be considered by the Examiner to be material to his/her examination. This listing should not be construed as representation that a search has been made or that no better art exists. No inference should be made that the documents are in fact material merely because they are referenced herein. Moreover, no representation is made that the brief descriptions of the references herein necessarily describe the most material aspects of the references. Further, by this listing, the applicant is not making any admission regarding the relative dates of the invention and listed disclosures.

Respectfully submitted,

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INFORMATION DISCLOSURE CITATION PAGE 1 OF 6	Atty Docket No. OPE-007	Serial No. 10/689,019
	Applicant Geoff W. Taylor	
	Filed October 20, 2003	Group

US PATENT DOCUMENTS

Examiner Initials		Document No.	Date	Name	Class	Subclass	Filing date if approp.
	A	6,479,844	11/12/02	Taylor	257	192	
	B	2002/0067877A1	06/06/02	Braun	385	15	
	C	6,351,001	02/26/02	Stevens et al.	257	223	
	D	2001/0043629	11/2001	Sun et al.	372	43	
	E	5,698,900	12/16/97	Bozada et al.	257	744	
	F	4,683,484	07/28/97	Derkits, Jr.	357	16	
	G	5,517,244	05/14/96	Stekelenburg et al	348	305	
	H	5,436,759	07/25/95	Dijaili et al.	359	333	
	I	5,422,501	06/06/95	Bayraktaroglu	257	195	
	J	5,386,128	01/95	Fossum et al.	257	183.1	
	K	5,337,328	08/09/94	Lang et al.	372	45	
	L	5,202,896	04/13/93	Taylor	372	50	
	M	5,105,248	04/14/92	Burke, et al.	357	24	
	N	5,010,374	04/23/91	Cooke et al.	357	16	
	O	4,995,061	02/19/91	Hynecek	377	58	
	P	4,949,350	08/14/90	Jewell et al.	372	45	
	Q	4,899,200	02/06/90	Shur et al.	357	30	
	R	4,829,272	05/09/89	Kameya	333	139	
	S	4,827,320	05/02/89	Markoc et al.	357	22	
	T	4,814,774	03/21/89	Herczfeld	432	372	
	U	4,806,997	02/21/89	Simmons et al.	357	16	
	V	4,658,403	04/14/87	Takiguchi et al.	372	96	
	W	4,584,697	04/22/86	Hazendonk et al.	377	60	

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INFORMATION DISCLOSURE CITATION PAGE 2 OF 6	Atty Docket No. OPE-007	Serial No. 10/689,019
	Applicant Geoff W. Taylor	
	Filed October 20, 2003	Group

US PATENT DOCUMENTS

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	A	4,424,535	01/03/84	Mimura	257	217	
	B	4,229,752	10/21/80	Hynecek	357	24	
	C	3,919,656	11/11/75	Sokal et al.	330	51	
	D	6,031,243	02/29/00	Taylor	257	192	
	E	5,422,501	06/06/95	Bayraktaroglu	257	744	
	F	5,698,900	12/16/97	Bozada et al.	257	13	
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FOREIGN DOCUMENTS

Examiner Initials		Document No.	Date	Name	Class	Subclass	Filing date if approp.
	A	PCT/US02/06802	09/12/02	Taylor			
	B	PCT/US03/13183	10/29/03	Taylor			
	C						
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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

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		Ula et al., "Simulation, Design and Fabrication of Thin Film Resistive-Gater Ga As Charge Coupled Devices," Electron Devices Meeting, 1990, pgs. 271-274;
		Bakker et al. "A Tracking CCD: A New CCD Concept." IEE Transactions on Electron Devices, Vol. 38, No. 5, May 1991, pgs. 1193-1200;
		Davidson et al., "GaAs charge-coupled devices", Can. J. Physics, Vol. 67, 1989, pgs. 225-231;
		Song et al. "Characterization of Evaporated Cr-SiO cermet films resistive-gate CCD applications", IEE Transations on Electron Devices, Vol. 36, No. 9, Sept. 1989; pgs. 1575-1597;
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		Beggs et al., "Optical Charge Injection into a Gallium Arsenide Acoustic Charge Transport Device," Journal of Applied Physics, Vol. 63, Issue 7, 1988 pgs. 2425-2430;
		Ablassmeier et al., "Three-phase Ga As Schottky-barrier CCD Operated up to 100-MHz Clock Frequency," IEE Transactions on Electron Devices, Vol. 27, No. 6 June 1980, pgs. 1181-1183
		Le Noble et al., Uniphase Operation of a GaAs Resistive Gate Charge-Coupled Device", Can. J. Physics, Vol. 70, 1992; pgs. 1143-1147
		Le Noble et al., "Two-Phase GaAs Cermet-Gate Charge-Coupled Devices," Can. J. Physics, Vol. 69, 1991, pgs. 224-227

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
		Ula et al., "Optimization of thin-film resistive-gate and capacitive-gate GAAs charge-coupled devices," IEEE Transactions on Electron Devices, Vol. 39, No. 5, May 1992, pgs. 1032-1040;
		LeNoble et al., "The Surface Potential Variation in the Interelectrode Gaps of GaAs Cermet-gate Charge-Coupled Devices," Solid-State Electronics, Vol. 33, No. 7, 1990, pgs. 851-857.
		Kodak CCD Primer, #KCP-001, Charge-Coupled Device (CCD) Image Sensors", http://www.kodak.com/US/en/digital/pdf/ccdPrimerPart2.pdf
		Gunapala et al., "Quantum Well Infrared Photodetector (QWIP) Focal Plane Arrays", Semiconductors and Semimetals series, Vol. 62, 1999
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		P.A. Kiley et al., "Submicrometre Gate Length Scaling of Inversion Channel Heterojunction Field Effect Transistor, Electronic Letters 3/17/94, Vol. 30. No. 6 pp. 529-531
		G. W. Taylor and P. A. Kiely, "Theoretical and Experimental Results for the Inversion Channel Heterostructure Field Effect Transistor, IEE Proceedings-G, Vol. 140, No. 6, December 1993;
		S.V. Bandara et al., Broad-Band GaAs/AlxGa1-xAs QWIPS, NASA Tech. Brief Vol. 23, No. 4 (from JPL New Technology Report NPO-20319) April, 1999
		Lee H. Wicks G & Eastman L.F., "High Temperature Annealing of Modulation Doped GaAs/A1 GaAs Heterostructures for FET Applications" IEEE/Cornell Conf. On High Speed Semiconductor Devices & Ckts, 8/83, pp. 204-208
		Taylor G. & Simmons J., Heterojunction Field-Effect Transistor (HFET) Electronics Letters, 17th July 1986, Vol. 22, No. 15, pp. 784-786
		Cates C., Serapiglia B., Dora Y, et al. "Detection of Terahertz Light With Intersubband Transition in Semiconductor Quantum Wells, University of California

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INFORMATION DISCLOSURE CITATION PAGE 6 OF 6	Atty Docket No. OPE-007	Serial No. 10/689,019
	Applicant Geoff W. Taylor	
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		Y. Akahori et al., "10-Gb/s High-Speed Monolithically Integrated Photoreceiver Using GaAs p-I-n PD and Planar Doped InA1As/InGaAs Hemt's", IEEE Photonics Technology Letters, Vol. 4, No. 7, July 1992
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		N.K. Dutta et al. "10-Ghz Bandwidth Monolithic p-i-n Modulation-Doped Field Effect Transistor Photoreceiver" Appl. Phys. Lett., Vol. 63, No. 15, October 11, 1993
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